

## CAR AUDIO/VIDEO EQUIPMENT

The present invention relates to an audio/video equipment,  
such as a CD, VCD or DVD player, for use in a car or motor  
5 vehicle.

## BACKGROUND OF THE INVENTION

Certain existing car audio/video apparatus have a fold-  
10 down control panel that can be removed for security  
purpose. Control keys are invariably provided on the outer  
side of the control panel for use when the panel is folded  
up into the normal position. Pivoting down of the control  
panel allows access to a CD or cassette tape slot behind,  
15 or detachment of the panel. A remote controller is often  
provided as a total separate item to enable control from a  
distance.

The invention seeks to provide an improved car audio/video  
20 equipment in the aforesaid aspects.

## SUMMARY OF THE INVENTION

According to the invention, there is provided a car  
25 audio/video equipment comprising a chassis including a  
front side having a bottom part, a playing mechanism  
provided in the chassis, and a control panel provided on  
the chassis front side for operating the playing

mechanism. The control panel has a bottom part detachably hinged to that of the chassis front side such that the panel is pivotable between an upward position lying flat on the chassis front side and a downward position  
5 extending therefrom for operation. A wireless link is provided between the control panel and the playing mechanism such that the playing mechanism is operable by the control panel when the panel is detached from the chassis, acting as a remote controller.

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Preferably, the control panel has a first side adjacent the chassis front side, on which a plurality of control keys is provided for operating the playing mechanism.

15 More preferably, the control panel includes a second side opposite the first side, the second side being substantially blank.

In a specific construction, each bottom part of the  
20 chassis front side and the control panel has left and right corners adjacent those of the other bottom part respectively, and the adjacent corners of each of the left and right pairs are releasably hinged together.

25 It is preferred that a releasable catch is provided between the chassis front side and the control panel for holding the panel in the upward position.

Preferably, the control panel dips at an acute angle in the downward position.

It is preferred that the control panel has generally the same shape and size as the chassis front side, and in the upward position covers substantially the entire chassis front side.

Preferably, the wireless link comprises an infrared link.

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In a preferred embodiment, the wireless link is provided by a pair of transmitter and receiver located at the control panel and the chassis front side respectively at positions generally aligned with each other such that the playing mechanism is operable by the control panel when the panel is attached to the chassis.

More preferably, the control panel is hinged to the chassis for pivotal movement generally about a horizontal hinge axis, and the transmitter and receiver are located adjacent the hinge axis.

Further more preferably, the transmitter and receiver are located at substantially central positions as between left and right along the width of the control panel and chassis.

In a different embodiment, the transmitter and receiver

are located at the same bottom corners of the control panel and chassis front side respectively.

#### BRIEF DESCRIPTION OF DRAWINGS

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The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

10 Figure 1 is a front perspective view of an embodiment of a car audio/video equipment in accordance with the invention, said equipment including a control panel shown pivoted closed;

15 Figure 2 is a front perspective view corresponding to Figure 1, showing the control panel pivoted down and open; and

Figure 3 is a front perspective view corresponding to  
20 Figure 2, showing the control panel detached.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring to the drawings, there is shown an audio/video  
25 equipment 10 for motor vehicles embodying the invention, which equipment 10 comprises a single DIN rectangular chassis 100, a disc playing mechanism 300 in the chassis 100, and a control panel 200 for controlling the operation

of the mechanism 300. The chassis 100 includes a flat rectangular front side 110, on which there are provided a horizontal slot 120 for the insertion of an audio/video disc for the playing mechanism 300 and an LCD display 122 to display the playing information, etc. The chassis front side 110 has a bottom edge 112 and a pair of opposed hinge studs 114 carried on respective protruding lugs 116 at opposite left and right ends (corners) thereof.

10 The control panel 200 is provided on the chassis front side 110, having generally the same oblong rectangular shape and size for matching therewith. The control panel 200 has a longer bottom edge 202 that is provided with a pair of hinge holes at opposite left and right ends (corners) thereof in engagement with the corresponding studs 114 of the chassis front side 110. The control panel 200 is thus hinged to the chassis front side 110 at their bottom edges for pivotal movement about a horizontal hinge axis between a vertical upward position (Figure 1) lying flat on the chassis front side 110 and a downward position (Figure 2) extending therefrom.

The control panel 200 has an inner side 210 adjacent or confronting the chassis front side 110, on which a plurality of standard control keys 212 is provided for operating the playing mechanism 300. The opposite, outer side 220 of the control panel 200 is blank, i.e. with control keys. In the downward position, the panel 200 is

folded down and opened to reveal its control keys 212 for operation, dipping at an acute angle to facilitate keying. In the upward position, the panel 200 is closed and covers the entire chassis front side 110, with its outer side 220  
5 deliberately rendered blank or vacant to disguise as if the control panel 220 were not there, i.e. having been removed, for security purpose.

To enhance such disguise of absence, the outer side 220  
10 may be provided with or printed with a picture or image of certain blank or internal elements such as screws, electrical connectors and/or a panel parking recess. Nonetheless, a main power switch, which is preferably a flat soft-touch key for inconspicuousness, may be  
15 relocated from the inner side 210 of the control panel 200 to the outer side 220 for convenient use by the user in merely resuming the operation of the equipment 10.

A releasable catch 230 is provided between the chassis  
20 front side 110 and the control panel 200, at the top right corners thereof, for holding the panel 200 in the upward position. The catch 230 is preferably magnetic for ease of operation or may take the form of a spring-loaded latch releasable by depressing a small button.

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Both of the hinges formed by respective pairs of studs 114 and holes 204 are releasable to allow detachment of the control panel 200 from the chassis 100. This can be done,

for example, by pushing the panel 200 slightly to the left where the lug 116 is resiliently deflectable or movable, thereby releasing the opposite right hinge, and then swinging the panel 200 out about the left hinge and  
5 pulling it off.

The signal communication between the control panel 200 and the playing mechanism 300 is enabled by a wireless infrared link. The link is established between an infrared  
10 transmitter 410 as part of the control panel 200 and an infrared receiver 420 connected to the playing mechanism 300 on the chassis front side 110. The transmitter 410 and receiver 420 are located centrally at the bottom edges 202 and 112 of the control panel 200 and chassis front side  
15 110 respectively, generally adjacent the aforesaid hinge axis and at central positions as between left and right along the width of the chassis 100 and panel 200.

The transmitter 410 and receiver 420 are aligned with each  
20 other and close together, such that the playing mechanism 300 is operable by the control panel 200 when the panel 200 is attached to the chassis 100. The infrared link will remain co-operable when the control panel 200 is detached from the chassis 100, acting as a remote controller for  
25 convenient.

The wireless link enables the same communication channel to be used between the control panel 200 and the playing

mechanism 300, which does not need to be changed or  
switched when the panel 200 is attached to or detached  
from the chassis 100. No electrical contact is required.  
The control panel 200 preferably operates on its own  
5 independent power source, such as a button battery cell,  
for simplicity.

It is envisaged that the transmitter 410 (410') may be  
located at a bottom corner of the control panel 200, with  
10 the receiver 420 (420') located at the same corner of the  
chassis front side 110. This allows the control panel 200,  
while being used as a remote controller, to be held and  
operated by one hand more conveniently with its  
transmitter 410' pointing at the receiver 420'.

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The invention has been given by way of example only, and  
various other modifications of and/or alterations to the  
described embodiment may be made by persons skilled in the  
art without departing from the scope of the invention as  
20 specified in the appended claims.